

May, 28, Sunday

15.00-18.00 Registration time
19.00-20.30 Welcome reception
Resort house Zvenigorodsky

May, 29, Monday

Morning session

Conference Hall
09.00-09.30 Welcome and Opening
Martina Heer
Oleg I. Orlov

CURRENT CONCEPTS IN GRAVITATIONAL PHYSIOLOGY – A TRIBUTE
TO INESSA KOZLOVSKAYA

Chairs: Charles Fuller & Martina Heer

09.30-10.00 The Roads of Inessa Kozlovskaya in Gravitational
Physiology
Anatoly I. Grigoriev and Boris S. Shenkman
10.00-10.30 Inessa Kozlovskaya: Society, Science & Collaboration
Charles A. Fuller

10.30-11.00 – Coffee break

11.00-11.30 Neuromuscular Adaptation to Gravity Changes: a Joined
French-Russian successful Collaboration
Yvonne Mounier
11.30-12.00 Top-Down v. Bottom-Up: 20 Years of Scientific Inquiry into
Post Flight Ataxia with Inessa Kozlovskaya
Bill Paloski
12.00-12.30 Professor Inessa Kozlovskaya, A Pioneer of Gravitational
Physiology Who Contributed Greatly To Promote Space Medicine In Japan
Tadaaki Mano

12.30-13.00 Development of the Russian Countermeasure System in Space flights at ISS.

Valery V. Bogomolov, Eugenia N. Yarmanova, Elena V. Fomina, Inessa Kozlovskaya

13.00-15.00 – Lunch break

Afternoon Sessions

Conference Hall

SKELETAL MUSCLE: HUMAN STUDIES

Chairs: Boris S. Shenkman & Joern Rittweger

15.00-15.20 The SARCOLAB pilot study: myotendinous and neuromuscular adaptation to long-term spaceflight J. Rittweger, M. Narici, K. Albracht, R. Bottinelli, L. Brocca, M. Capri, C. Morsiani, M. Flueck, C. Franceschi, M. Moriggi, C. Gelf, P. Cerretelli

15.20-15.40 Influence of prolonged (>180 day) space flight on human skeletal muscle architecture and maximal voluntary contractions. Yu. Koryak, S. Volkov, O. Skripochka, A. Ovchinin, I. Kozlovskaya

15.40-16.00 Early modifications of regulatory proteins and glycolytic profile in human skeletal muscle after short-term 3-day dry immersion. L. Stevens, L. Cochon, M. Pourrier, V. Montel, B. Bastide

16.00-16.20 Early molecular signature of human vastus lateralis muscle after 3 days of dry immersion. R. Demangel, G. Py, T. Brioche, A.F. Pagano, A. Chopard

Auditorium 2

CELL BIOLOGY, IMMUNOLOGY & OMIC'S STUDIES 1

Chairs: John Love & Lyudmila B. Buravkova

15.00-15.20 Stem Cell Research on the International Space Station. J. Love, J. Buchli

15.20-15.40 Immunological Aspects of long-duration space flights. M.P. Rykova, S.A. Ponomarev, E.N. Antropova

15.40-15.55 Analysis of the effects of different salt consumption levels on the urine protein composition during a 105-day isolation using the opoSOM program L.H. Pastushkova, D.N. Kashirina, A.G. Brzhozovsky, A.S. Kononikhin, E.N. Nikolaev, H. Binder, I.M. Larina

15.55-16.10 The effects of long-term simulated microgravity on mesenchymal stem cells. A. Ratushnyy, D. Yakubets, O. Grigorieva

16.10-16.25 The secretome of endothelial cells in modelled microgravity conditions. D.N. Kashirina, E.G. Rudimov, A.S. Kononikhin, I.M. Larina, L.B. Buravkova

16.30-17.00 – Coffee break

Conference Hall

SKELETAL MUSCLE: MOLECULAR MECHANISMS

Chairs: Laurence Stevens & Ivan M. Vikhlyantsev

17.00-17.20 AMPK as a key player in unloading-induced muscle remodeling. B. Shenkman, N. Vilchinskaya

17.20-17.40 Regulatory proteins as molecular markers associated with muscle disuse in human and rodent models. L. Stevens, V. Montel, L. Cochon, B. Bastide

17.40-18.00 Sphingomyelinase activity, prooxidant and antioxidant status in rat soleus muscle during short-term hindlimb unloading. I.G. Bryndina, V.A. Protopopov, A.V. Secunov, M.A. Shalagina, S.V. Ovechkin, A.A. Iakovlev, V.G. Sergeev

18.00-18.15 Time course changes in anabolic signaling and protein synthesis in rat postural muscle during recovery from simulated microgravity T. Mirzoev, S. Tyganov, I. Petrova, B. Shenkman

18.15-18.30 Hyperphosphorylation of titin under microgravity conditions. I. Vikhlyantsev, A. Ulanova, Yu. Gritsyna, N. Salmov, B. Shenkman, Z.A. Podlubnaya

Auditorium 2

CELL BIOLOGY, IMMUNOLOGY & OMIC'S STUDIES 2

Chairs: John Love & Ludmila B. Buravkova

17.00-17.20 Transcriptomic profiling of mice lungs after long-duration space flight on ISS. L.B Buravkova, N.A. Khaustova, E.N. Knyazev, O.V Grigorieva, V.V. Galatenko, I.V. Ogneva

17.20-17.40 Transcriptomic profile of mice spinal cord after 30 day space flight and subsequent 7 days readaptation. M.S. Kuznetsov, P.N. Rezvyakov, K.D. Volkov, A.N. Lisyukov, O.V. Tyapkina, E.E. Nikolskiy, R.R. Islamov

17.40-17.55 DNA total methylation level in cardiomyocytes and lung tissue cells of mice under long-term spaceflight. I.V. Ogneva, V.N. Sychev

17.55-18.10 Characterization of erythroid precursors from murine bone marrow after 30-day space flight and hindlimb unloading. E.A. Markina, E.V. Sotnikova, E.R. Andreeva

18.10-18.25 Connective tissue of internal organs as a part of the antigravitational system. D.A. Atyakshin, E.A. Ilyin, V.V. Shishkina

May, 30, Tuesday

Morning session

Conference Hall

NEUROVESTIBULAR & SENSORIMOTOR RESPONSES TO LONG-DURATION SPACEFLIGHT

Chairs: Inessa B. Kozlovskaya & Millard F. Reschke

09.00-09.15 Introduction

Inessa B. Kozlovskaya

09.15-09.40 Sensorimotor regulation of posture and locomotion without supraspinal control

Yury P. Gerasimenko, Inessa B. Kozlovskaya, Victor R. Edgerton

09.40-10.05 Resistance exercise training to counteract strength loss in long-term space flight. From space station MIR flights to experiment MARS 500

Harald Tschan, Norbert Bachl, Ramon Baron, Thomas Angeli, Inessa B. Kozlovskaya

10.05-10.30 Vestibulo-cardiovascular reflex during head-up tilt after long-duration space flights

Kunihiko Tanaka, Hironobu Morita

10.30-11.00 Neuroplasticity changes of brain cortical areas induced by the use of the stimulation support receptors and the multimodal exoskeleton complex in healthy subjects and poststroke patients

Liudmila A. Chernikova, Irina V. Saenko, Alexandra G. Poydasheva, Anastasya E. Khizhnikova, Elena I. Kremneva, Sofia N. Morozova, Rodion N. Konovalov, Inessa B. Kozlovskaya

11.00-11.30 – Coffee break

11.30-12.00 Recovery of sensorimotor and vestibular function following long-duration space flights

Millard F. Reschke

12.00-12.30 The primates research program in BION missions Eugene A. Ilyin & Boris A. Lapin

12.30-13.00 Useful proprioceptive interventions after stroke
Stefan M. Golaszewski, Martin Seidl, Alexander B. Kunz, Monica Christova,
Kerstin Schwenker, Eugene Gallasch, Eugen Trinka, Franz Gerstenbrand

13.00-15.00 – Lunch break

Afternoon Sessions

Conference Hall

SENSORIMOTOR STUDIES 1

Chairs: Yury P. Gerasimenko & Elena S. Tomilovskaya

15.00-15.20 Changes of physiological characteristics of locomotions induced by long term exposure to weightlessness. E.S. Tomilovskaya, I.V. Rukavishnikov, V.I. Brykov, A.A. Saveko, Yu.S. Semenov, I.B. Kozlovskaya

15.20-15.40 Postural control changes after a 3-day dry immersion. C. Millet, G. Gauquelin-Koch, C. Gharib, L. Treffel

15.40-16.00 Vestibular function during and after prolonged exposure to microgravity. I.A. Naumov, L.N. Kornilova, G.A. Ekimovskiy, D.O. Glukhikh, A.S. Pavlova, V.V. Khabarova

16.00-16.20 Effects of axial loading on characteristics of evoked motor responses in shin extensor muscles under conditions of Dry Immersion. I.N. Nosikova, A.Z. Zakirova, T.A. Shigueva, E.S. Tomilovskaya, I.B. Kozlovskaya

Auditorium 2

NEUROSCIENCE & BEHAVIOR

Chairs: Daniella Santucci & Victoria I. Gulimova

15.00-15.20 Stress, coping and resilience in isolation studies: role of neurotrophins. D. Santucci, N. Francia, F. Strollo

15.20-15.40 Behavioral Biology of Rodents in Spaceflight. J.R. Alberts, C.A. Fuller

15.40-16.00 Primates in Space: The Bion Flights Advance Our Understanding of Gravitational Physiology. C.A. Fuller, J.R. Alberts

16.00-16.15 Spatial orientation of geckos in weightlessness. V.M. Barabanov, V.I. Gulimova, R.K. Berdiev, S.V. Saveliev

16.15-16.30 Physiological and institutional implications of the astronaut training: what is at stake in future manned spaceflights programs?
J. Patarin-Jossec

16.30-17.00 – Coffee break

Conference Hall

SENSORY-MOTOR STUDIES 2

Chair persons: Yury Gerasimenko & Elena S. Tomilovskaya

17.00-17.20 Peculiarities of human walking under different level of gravitational loading on musculoskeletal system. A.V. Shpakov, A.V. Voronov

17.20-17.40 Visual-manual tracking in antiorthostatic hypokinesia ("bedrest"). D. Glukhikh, L. Kornilova, E. Habarova, I. Naumov, G. Ekimovskiy, P. Denise, S. Abreu, H. Normand

17.40-18.00 Changes in muscle properties during a 180-day confinement (CELSS). Preliminary results. L. Treffel, Du Fang, Xu Zi, G. Gauquelin-Koch, Wang Jingyu, J-C. Lloret, M.-A. Custaud, Yuan Ming, C. Gharib, Li Yinghui

18.00-18.20 Neurological symptoms in Parkinson's disease respond to a course of analogue microgravity induced by dry immersion. A. Meigal, L. Gerasimova-Meigal, N. Subbotina, O. Tretiakova, I. Saenko, L. Chernikova

Auditorium 2

RESPIRATORY PHYSIOLOGY

Chairs: Viktor M. Baranov & Uwe Hoffmann

17.20-17.40 Activity of central respiratory mechanism in microgravity. V.M. Baranov, G.G. Tarasenkov, I.V. Alferova, T.G. Shushunova, E.S. Natura, V.P. Katuntsev

17.40-18.00 The lung function and fluid shifts under negative inspiratory pressure breathing in spaceflight. J. Popova, A. Suvorov, R. Zaripov, A. Dyachenko

18.00-18.20 Pulmonary gas exchange as an estimate of lung perfusion during changing gravity. U. Hoffmann, J. Koschate, L. Thieschaefer, U. Drescher, A. Werner

May, 31, Wednesday

Morning session

Conference Hall

FLUID SHIFTS DURING SPACEFLIGHT: MAGNITUDE & CONSEQUENCES

Chairs: Marc-Antoine Custaud & Olga Vinogradova

09.00-09.30 Introduction

Olga Vinogradova & Marc-Antoine Custaud

09.30-10.15 Fluid shifts and blood pressure adaptation to spaceflight

Peter Norsk

10.15-11.00 Fluid shifts and brain circulation

Michael Delp

11.00-11.30 – Coffee break

11.30-12.15 Does fluid shifts depend on body size?

Alexander Andreev-Andrievskiy

12.15-13.00 Fluid-shifts & countermeasures

Marc-Antoine Custaud

13.00-15.00 – Lunch break

Afternoon Sessions

Conference Hall

CARDIOVASCULAR PHYSIOLOGY

Chairs: Michael Delp & Tadaaki Mano

15.00-15.15 S. Prolonged head-down bed rest (HDBR) decreases Otolith-Neck Sympathetic Response (ONSR). De Abreu, P. Denise, H. Normand

15.15-15.30 Disuse and Radiation-Induced Osteopenia: A Potential Vascular Coupling Mechanism. M. Delp, J. Alwood, Y. Shirazi- Fard, A-S. Schreurs, R. Globus

15.30-15.45 Oscillometric Arterial Pulse Wave Analysis in Microgravity - a Feasibility Study in Parabolic Flight. B. Hametner, M. Bachler, S. Moestl, P. Gauger, K. Heusser, U. Limper, S. Wassertheurer, J. Tank

15.45-16.00 Bioelectric properties of the myocardium and their changes in long-term space flight during physical exercise. V. Rusanov, A. Chernikova, R. Baevsky, O. Isaeva

16.00-16.15 Effects of zero magnetic field on heart rate variability in human experiment. Yu.I. Gurfinkel, A.L. Vasin, M.L. Sasonko

16.15-16.30 Changes of blood and body fluids in tail-suspended mice. A.S. Popova, A.A. Andreev-Andrievskiy, E.A Lagereva, O.L. Vinogradova

16.30-17.00 – Coffee break

17.00-18.30

POSTER SESSION (see below)

All presenting authors should be present at their posters.

20.00 Gala dinner

Restaurant Areg

Bus Transfer to Gala dinner at 19.40 & 19.55 from the Resort house Zvenigorodsky

22.00-22.30 Return time

June, 1, Thursday

Morning session

Conference Hall

SPACE EXPLORATION & AN INTEGRATED COUNTERMEASURE:
ARTIFICIAL GRAVITY

Chairs: Peter Norsk & Oleg I. Orlov

09.00-09.10 Introduction

Peter Norsk

09.10-09.40 Known and unknowns of a human mission to Mars.

William H. Paloski

09.40-10.10 What have we learned about Artificial Gravity from translational studies using rodents?

Charles A. Fuller

10.10-10.40 Intermittent application of artificial gravity during simulated microgravity in rats.

Junichi Tajino

10.40-11.10 – Coffee break

11.10-11.40 Intermittent application of artificial gravity and exercise during simulated microgravity in humans.

Satoshi Iwase

11.40-12.10 The centrifuge at the Moscow's Institute of Medical and Biological Problems and the plans of Russian scientists for demonstrating artificial gravity in space.

Oleg I. Orlov

12.10-12.40 Results of women body liquid dynamic monitoring with «Sprut-2» device during «head - to feet» (+Gz) overload with the short-armed centrifuge.

Yury I. Smirnov

12.40-13.00 Questions and Discussion

13.00-15.00 – Lunch break

Conference Hall
ARTIFICIAL GRAVITY
Chairs: Satoshi Iwase & Elena V. Fomina

15.00-15.20 Effect of artificial gravity with exercise on spaceflight deconditioning in humans, and project for assessment of artificial gravity in H-II Transfer Vehicle in International Space Station. S. Iwase, N. Nishimura, K. Tanaka, T. Mano, K. Shimada

15.20-15.40 The bearded dragon lizard (*Pogonavitticeps*) as model to study long-term hyperloading on embryonic bone formation. A.J.G. Hopman, M.J.A. Schoonderwoerd, A.L.J.J. Bronckers, J.J.W.A. van Loon

15.40-16.00 The influence of the short-term overloads in the «head-pelvis» direction on the human innate and adaptive immune system condition. S.A. Ponomarev, S.A. Kalinin, A.V. Muranova, M.P. Rykova, E.N. Antropova, A.V. Sadova, O.V. Kutko, M.I. Koloteva

16.00-16.20 Disturbance in Rats' Spatial Learning Ability Induced by Simulated Microgravity and Efficacy of Intermittent Artificial Gravity as a Countermeasure using Centrifugation. J. Tajino, A. Ito, M. Nagai, X. Zhang, Sh. Yamaguchi, H. Iijima, W. Kiyan, T. Aoyama, H. Kuroki

16.30-17.00 – Coffee break

Conference Hall
COUNTERMEASURES
Chairs: Satoshi Iwase & Elena V. Fomina

17.00-17.20 Preventing the detrimental effects of two months of bed rest on muscle, bone and cardiovascular system with a few minutes of exercise per day. A. Kramer, A. Gollhofer, J. Kuemmel, G. Armbrrecht, D. Felsenberg, D. Belavy, M. Gruber

17.20-17.40 The efficiency of locomotor training onboard the ISS depending on ground reaction forces individual features. A.O. Savinkina, N.Y. Lysova, E.V. Fomina.

17.40-18.00 Effects of combined whey protein, KHCO₃ supplementation and resistive vibration exercise on insulin sensitivity in bed rest (MNX-study). M. Heer, S. Graf, D. o'Gorman, S. Blanc, S. Zwart, S. Smith, T. Heise, N. Baecker.

18.00-18.20 Influence of axial loading under conditions of gravitational unloading on various groups of human muscles. S. Rezvanova, E. Fomina, T. Kukoba, D. Babich, N. Novikova, V. Kitov

June, 2, Friday

Regional tour

Bus Departs at 9.00 from the Resort house Zvenogorodsky

Estimated return time 17.00

POSTER SESSION

1. I.B. Alchinova, E.N. Yakovenko, V.V. Kushin, K.O. Inozemtsev, M.Yu. Karganov, V.M. Baranov. The «PHOENIX» Space Experiment: Preliminary Results

2. L. Mishchenko, V. Petrenkova, I. Mishchenko. Efficiency of transformed environment on stability to soybean mosaic virus of soybean plants

3. D.A. Atiakshin, A.S. Burtseva, E.A. Ilyin. Microgravity effects upon expression of tryptase and chymase in mast cells of the mongolian gerbils' digestive system

4. E.A. Lagereva, T.S. Gurieva, E.I. Mednikova, A.S. Popova, M.A. Mashkin, V.N. Manskikh, O.L. Vinogradova, A.A. Andreev-Andrievskiy. Preliminary evaluation of mice diets developed for BION-M2 space experiment

5. I.S. Sosnina, I.N. Nosikova, R.S. Pomelov, K.A. Zelenskiy, N.Y. Osetskiy, E.S. Tomilovskaya. Study of the effects of support withdrawal on accuracy of voluntary movements in the task of force gradation

6. J. Patarin-Jossec. The five senses standing the test of long-duration human spaceflights: an anthropological approach

7. K.V. Gordienko, E.A. Chernikhova, V.E. Novikov, A.M. Nosovsky, G.Yu. Vassilieva. Analysis of mineralization of human skeletal segments in weightlessness

8. M.S. Kupriyanova, I.V. Ogneva. Content of mRNA genes, encoding cytoskeletal proteins, in ovary tissue of *Drosophila melanogaster* after 80-hours position at the random position machine

9. M.I. Ezbekova, A.Yu. Ratushnyy, L.B. Buravkova. Angiogenic potential of human mesenchymal stromal cells under simulated microgravity

10. V. Montel, J. Dereumetz, B. Bastide, L. Stevens. Development of a chronic recording method of EMG activity by telemetry in mice skeletal hindlimb muscles during long-term space experiment

11. N. Nishimura, S. Iwase. Measurement of body fluid distribution with during -6° head-down bed rest using segmental bioelectrical impedance analysis

12. O.V. Grigorieva, A.Yu. Ratushny, S.V. Gal'chuk. Application of the method of microfluometry for conducting experiments with cells in microgravity

13. O.O. Kiryukhina, D.K. Gaynullina, O.S. Tarasova, O.L. Vinogradova. The mechanisms of endothelium-dependent relaxation in two murine arteries which were differently affected in Bion-M №1 spaceflight

14. D.V. Popov, M.A. Maynskova, A.G. Brzhozovsky, I.M. Larina. Comparison of different methods for skeletal muscle samples preparation for proteome analysis by HPLC-MS/MS

15. E.A. Rudenko, A.A. Puchkova, M.V. Baranov. Research of peripheral circulation in head-up bedrest (HUBR) and head-down bedrest (HDBR) with constant and variable tilt angle

16. T.A. Shigueva, A.Z. Zakirova, E.S. Tomilovskaya, I.B. Kozlovskaya. The effects of support unloading on the characteristics of inhibitory processes in the spinal cord – studies of motor units` activity

17. T.V. Sukhostavtseva, A.N. Kotov. Evaluation of orthostatic tolerance in humans after prolonged head-down and head-up bed rest

18. M.A. Usik, I.V. Ogneva. Cytoskeleton structure of testis tissue cells of mice after 30-days hindlimb unloading

19. A. Proshchina, A. Kharlamova, V. Barabanov, V. Gulimova, S. Saveliev. Anterior cerebellum of thick-toed geckos (*Chondrodactylus turnery* GRAY, 1864) after the long-term space flight on the biosatellite BION-M1

20. V.F. Bazarny, P.V. Novitskaya, V.A. Gurov. Cellular-genetic energy of students with different modes of learning

21. C.A. Lyubimova, Yu.N. Lomonosova, G.R. Kalamkarov, B.S. Shenkman. Reduced NO content in unloaded rat soleus muscle facilitates the GSK-3 β - mediated decline of MyHC(I β) mRNA expression

22. A.P. Pamova, A.V. Suvorov. The effect of model weightlessness on skin microcirculation during dry immersion for 5 days

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